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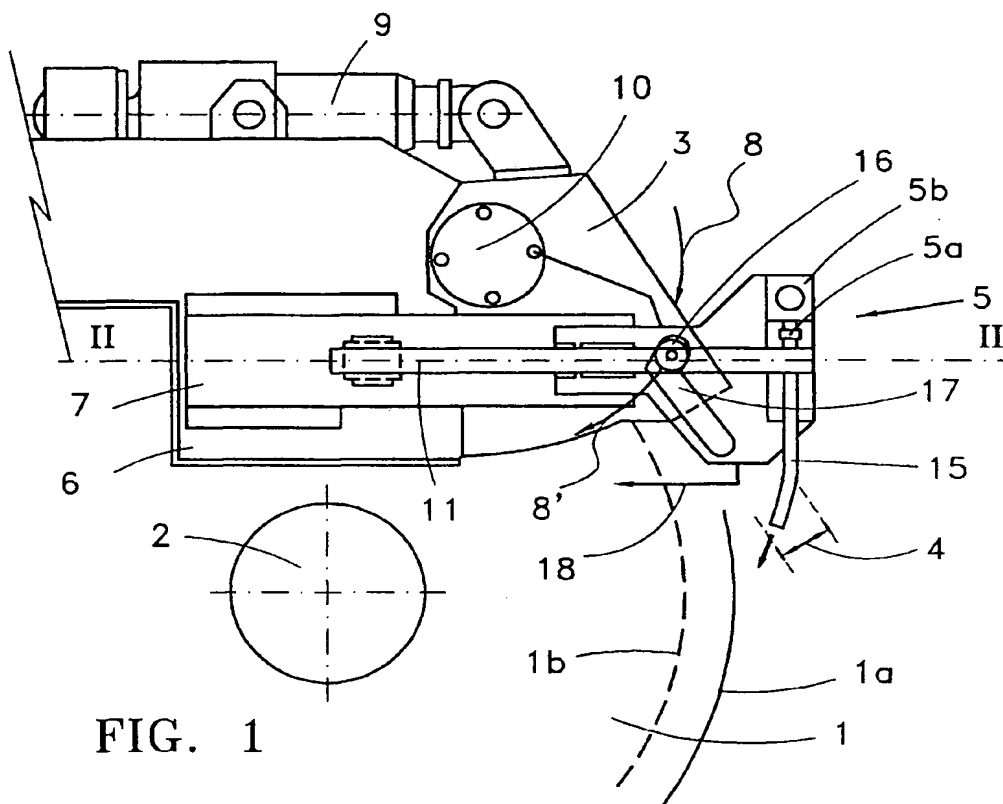
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(54) **Protective shield and coolant distributor for a grinding machine**

(57) The visor-shaped protective shield (3) tips around a shaft (10) to keep a limit distance (4) separation from the perimeter (1b) of the wheel (1) as it wears. Tipping (8) takes place automatically with independent means impelled by a rod (9). The coolant distributor (5) is movable, and incorporates a number of nozzles (15) which permanently target the machining area. The cool-

ant distributor (5) is displaced without the cooperation of drive components of its own, and comprises a mobile casing (5c) supporting the nozzles (15) and housing a displacement rod (11), a roller (16) attached to the shield (3) which moves along an inclined runner slot (17) forming part of the side wall of the mobile support casing (5c), to transmit the shield (3) movement to the coolant distributor (5).



**FIG. 1**

## Description

The present invention relates to a protective shield with a coolant fluid distributor for the wheel of a grinding machine, and particularly to the associated mechanism for moving it.

### PRIOR ART

In US-4619078 (GB- 2144510), the nozzles that discharge the coolant fluid are carried by the protective shield and are targeted permanently on the contact between the wheel and the part being machined in order to compensate the reduction in the diameter of the wheel. The shield is tipped in controlled form by a motor around the shaft of the wheel but according to the outline of the part to be machined, which may sometimes have a complex surface. This angular movement of the shield is transmitted to the coolant nozzles by means of a worm spindle and mesh, also depending on the part to be machined.

The solution disclosed in US-4619078 for targeting the coolant onto the machined area of the component is to move the nozzles radially in relation to the wheel with a second motor, e.g. an electric motor, driven by the signals from the optical sensors of the wheel diameter. If it is the protective shield rather than the nozzles which moves radially in this way, the nozzles are secured firmly to the shield which is moved by the second motor.

This grinder solves the problem of the movement of the coolant distributor as the wheel diameter is worn down, permanently targeting the nozzles on the machining area. However, two motors are required, one to move the shield and the other to move the nozzles, with their respective controls, since the movement of the shield depends on the outline of the part to be machined while that of the nozzles depends on the wear to the wheel.

In US-4,365,446, the coolant nozzle is supported by the visor-shaped guard of the wheel, but together, and both can be moved depending on the wear to the wheel, though they both move at the same time and the guard does not tip, the movement being performed manually by the operator. This displacement is guided by a roller that moves along a runner slot.

### DISCLOSURE OF THE INVENTION

The object of the present invention is a protective shield for the wheel of a grinding machine and a associated mechanism for the simultaneous displacement of the coolant fluid distributor to which the fluid taps and nozzles are fixed, in order to ensure the regulation of a limited distance between the shield and the surface of the wheel as it is worn, while at the same time maintaining the aim of the coolant jets targeted to the machining area, but using the drive and control components of the

shield to displace the coolant distributor and nozzles, depending on the shield angular movement.

The protective shield and coolant distributor that is the object of the invention comprises:

- a protective shield partly surrounding the grinder wheel above and on both sides, supported by a machine frame panel, and having means for automatically making it to tip over the wheel around its own shaft different from that of the wheel, being kept below a limit value the separation distance from the perimeter of the wheel as it wears;
- a coolant fluid distributor comprising a hollow distributor bar housing the fluid taps and a number of fluid nozzles extending downwards to permanently target the machining area, a linearly displaceable casing associated to the automatic tipping of the protective shield and supporting the distributor bar;
- a transmission mechanism associated to the shield that impels the distributor casing to displace the coolant distributor linearly in a guided manner in relation to the wheel wear;

The advantage of the protective shield and associated transmission mechanism moving the coolant distributor that is the object of the invention is the exclusive dependence on the tipping of the shield without the use of drive means or sensors for the coolant distributor.

### DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of the protective shield of the wheel in a grinding machine and the associated coolant distributor which is the object of the invention.

FIG. 2 is a cross-section view of the shield and associated distributor movement mechanism, along II-II in figure 1.

### PREFERRED EMBODIMENT OF THE INVENTION

With reference to figures 1 and 2 which show an embodiment of the invention, the wheel 1 of a grinding machine rotates around a shaft 2 and is protected with a visor-shaped shield 3 with side walls supported on the grinder structure; the coolant distributor 5 consists of a number of taps 5a situated along a hollow bar 5b extending transversally to the plane of the wheel 1, and the coolant is targeted by the nozzles 15 toward the machining area. The protective shield 3 tips as indicated by the arrow 8 around its own shaft 10 to approach the edge of the wheel as it wears, e.g. from an initial perimeter or diameter 1a to a reduced diameter 1b as shown in figure 1, to ensure a limited distance 4 between them, automatically propelled by the rod 9.

The bar 5b of the distributor 5 is rigidly supported on a hollow rectangular casing 5c placed to form a square with the bar 5b on one side of the shield 3 and adjacent to it. the casing 5c contains the displacement

rod 11 which is secured at one end to the front wall of the casing 5c, pulling the distributor 5 toward the wheel 1. The displacement rod 11 is directed as it slides between two linear guides 13 and 14 which are spaced and supported by an intermediate plate 7 fixed to the frame panel 6 forming part of the machine. 5

The transmission mechanism 5c, 7, 11, 16, 17 that links the tipping of the shield 3 and the movement of the distributor 5 comprises in addition to the displacement rod 11 housed into the casing 5c, a roller 16 forming part of the side wall of the shield 3, the other end of which moves along the runner slot of the casing 5c adjacent to the shield 3, inclined from the horizontal so that said movement leads to the horizontal displacement of the distributor 5 as indicated by the arrow 18, thus bringing the coolant nozzles 15 toward the wheel 1 and ensuring that they are targeted toward the machining area. 10 15

The casing 5c of the distributor has a side wall with a profile formed by a straight part juxtaposed to the shield 3, and a V-shaped part in front of the wheel to raise the distributor bar 5b over the machining area. The runner slot 17 is located at a side wall of the casing 5c which is juxtaposed to the shield 3 and is L-shaped, the longer arm inclined against the horizontal displacement rod 11, while the short arm acts as a stop for the roller 16 for a rest position for the shield 3 and distributor 5 when the grinder is stopped. 20 25

## Claims

1. Protective shield and coolant distributor for a wheel grinding machine, the shield (3) having drive means (9) for make it to tip (8) automatically around its own shaft (10) for keeping a limited distance (4) from the wheel perimeter (1b) depending on its wear, and the coolant distributor (5) including a distributor bar (5b) fixing the coolant nozzles (15), a support (5c) for the distributor bar (5b), and means (5c,7,11,16,17) for moving the distributor bar (5b) in relation to the wheel (1), so as the nozzles (15) are permanently targeting the machining area, characterized in that the means (5c,7,11,16,17) for moving the coolant distributor (5) automatically, are only associated to the tipping (8) of the protective shield (3), through a transmission mechanism (7,11,16,17) that impels the coolant distributor (5) linearly. 30 35 40 45
2. The protective shield and coolant distributor of claim 1, wherein said means (5c,7,11,16,17) for moving the coolant distributor (5) include a distributor casing (5c) supporting the distributor bar (5b), that is placed adjacent to the shield (3) and extended horizontally, and the transmission mechanism (7,11,16,17) comprises a displacement rod (11) inside the distributor casing (5c) and secured to it at one end, an intermediate support plate (7) for the displacement rod (11) fixed to the machine frame 50 55

(6), a roller (16) attached to the tipping shield (3) whose protruding end is housed in a runner slot (17) inclined from the horizontal belonging the distributor casing (5c).

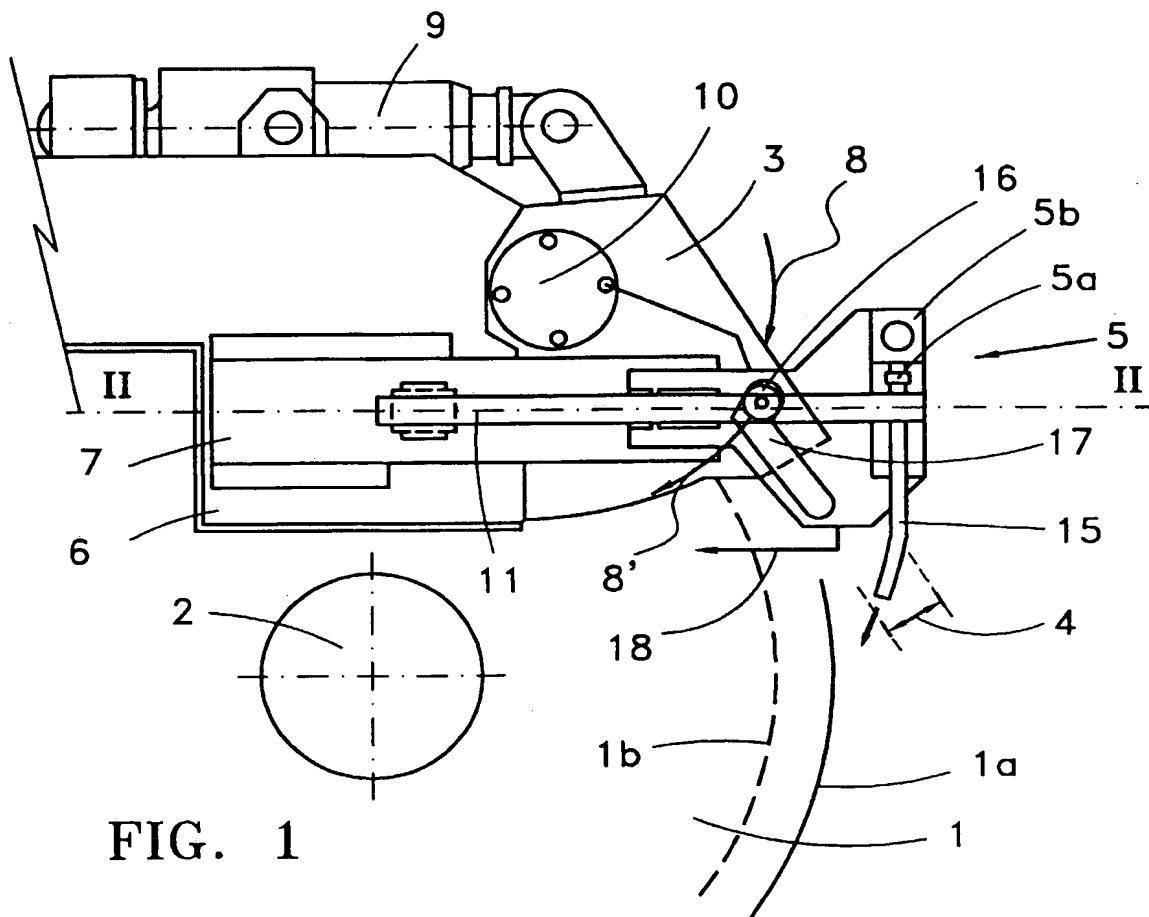


FIG. 1

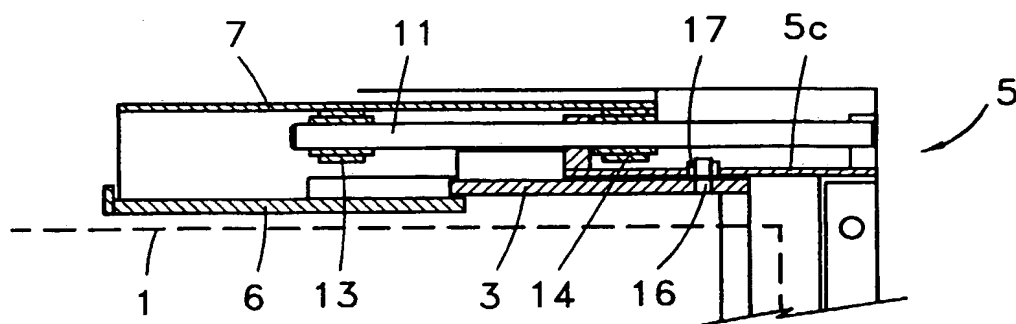


FIG. 2



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# EUROPEAN SEARCH REPORT

Application Number  
EP 97 50 0014

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 4 314 425 A (BRICKER ET AL) 9 February 1982 * the whole document *	1	B24B55/04
Y	---	2	
Y	PATENT ABSTRACTS OF JAPAN vol. 016, no. 087 (M-1217), 3 March 1992 & JP 03 270874 A (TOYODA MACH WORKS LTD), 3 December 1991, * abstract *	2	
A	FR 2 202 455 A (SCHAUDT MASCHINENBAU G.M.B.H.) 3 May 1974 * page 7, line 1 - line 31; figures 4,5 *	1	
A	US 4 929 130 A (DIEBOLT ET AL) 29 May 1990 * abstract; figures *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B24B
Place of search		Date of completion of the search	Examiner
THE HAGUE		14 May 1997	Garella, M
CATEGORY OF CITED DOCUMENTS			
X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ..... &: member of the same patent family, corresponding document	

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